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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/824,064	04/03/2001	Eva Ingegerd Ejerhed	003300-769	9262

21839 7590 02/10/2005

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EXAMINER

HARPER, V PAUL

ART UNIT PAPER NUMBER

2654

DATE MAILED: 02/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/824,064	Applicant(s) EJERHED, EVA INGEGERD	
	Examiner V. Paul Harper	Art Unit 2654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 2 is objected to because of the following informalities:

On line 6, of claim 2, the phrase "syntac function" should read –syntactic function--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1-4, 9-13, and 16-20 are rejected under 35 U.S.C. 102(a) as being anticipated by Wang et al. ("A Question Answering System Developed as a Project in a Natural Language Processing Course", ANLP/NAACL Workshop, May 4, 2000), hereinafter referred to as Wang.

Regarding **claim 1**, Wang describes a question answering system that derives answers from a plain text document (abstract, Fig. 1). Wang's method includes the following steps:

- analyzing a computer readable representation of said question clause with respect to syntactic functions of its constituents and the lexical meaning of its word tokens (Fig.

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1, §2, 1st ¶, question is tagged as to part-of-speech, semantic information, and lexically disambiguated; see Fig. 2, note, features shown include LABEL=subject—syntactic function);

- defining, in response to the analysis step, a set of conditions for a clause in said natural language text database to constitute an answer to said question clause (Fig. 1, item 5, Sentence-to-Question Comparision; §2, features for comparison; Fig. 2, §2.4),
- said conditions comprising a condition stipulating that, for a clause in said natural language text database to constitute an answer to said questions clause, at least one of the constituents of said question clause should have a corresponding constituent in said clause having the same syntactic function and an equivalent lexical meaning (§2.4, e.g., a comparison is made using phrase-to-phrase comparisons; §2.2.1, synonyms considered);
- identifying clauses in said natural language text database that satisfy said conditions (§2.4, comparisons are made between each sentence and each question, comparisons are stored); and
- returning answers to said question clause by means of the identified clauses that match said conditions (Fig. 1, Answer with the Highest Score; §2.5).

Regarding **claim 2**, Wang teaches everything claimed, as applied above (see claim 1). In addition, Wang teaches “a verb condition stipulating that a clause constitutes an answer to said question clause if a lexically headed constituent having the syntactic function of main verb of said question clause has a corresponding lexically

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headed constituent in said clause bearing the syntac [sic] function of main verb and having an equivalent lexical meaning" (Fig. 2, examples for matching where processed items include TYPE=verb; §2.2.2, 1st ¶, Verb phrases have feature types ...; §2.2.2, VPs have feature type **Base**).

Regarding **claim 3**, Wang teaches everything claimed, as applied above (see claim 1). In addition, Wang teaches "a subject condition stipulating that a clause constitutes an answer to said question clause if a lexically headed constituent having the syntactic function of subject of said question clause has a corresponding lexically headed constituent in said clause having the syntactic function of subject and having an equivalent lexical meaning" (Fig. 2, examples for matching where processed items include LABEL=subject; §2.2.2, Label1 ... e.g., subject; §2.2.2, NP have feature type **Base** [rood word of head word of NP]).

Regarding **claim 4**, Wang teaches everything claimed, as applied above (see claim 1). In addition, Wang teaches "an object condition stipulating that a clause constitutes an answer to said question clause if a lexically headed constituent having the syntactic function of object of said question clause has a corresponding lexically headed constituent in said clause having the syntactic function of object and having an equivalent lexical meaning" (Fig. 2, "Cub Scouts" LABEL=object; §2.2.2).

Regarding **claims 9 and 10**, Wang teaches everything claimed, as applied above (see claim 1); in addition, Wang teaches “wherein there is an interrogative pronoun in said question clause, further comprising the step of: determining the syntactic function of the queried constituent of said question clause in response to the analysis step and said interrogative pronoun; and wherein the syntactic function of the queried constituent of said question clause is determined as the syntactic function of said interrogative pronoun” (§2, syntactic and semantic analysis is performed on the query, §2.5, §3 in particular ¶1, who-questions are given special consideration).

Regarding **claim 11**, Wang teaches everything claimed, as applied above (see claim 9). In addition, Wang teaches “the analysis of lexical meaning of word tokens comprises an analysis of the broad semantic class of each word token of said natural language text database, and wherein the broad semantic class of the queried constituent is determined in response to the interrogative pronoun (§2.2.1, interfaces with WordNet to determine a word’s base/stem, semantic type, and synonyms; lexical categories include **type** [interrogative]).

Regarding **claim 12**, Wang teaches everything claimed, as applied above (see claim 1). In addition, Wang teaches “extracting from said natural language text database portions of text comprising clauses satisfying said conditions” (Fig. 1, Answer with the Highest Score; §2.4, last sentence, “each sentence was passed to the answer module”; §2.5).

Regarding **claim 13**, Wang describes a question answering system that derives answers from a plain text document (abstract, Fig. 1). Wang's system includes the following:

- storage means comprising said natural language text database which has been analyzed with respect to syntactic functions of constituents, lexical meaning of word tokens, and clause boundaries (Fig. 1, Plain Text [Story and Questions] item 3 with inherent storage of the Plain Text [natural language text database]);
- analyzing means for analyzing a computer readable representation of question clause of a natural language question with respect to syntactic functions of its constituents and lexical meaning of its word tokens (Fig. 1, input [Questions] followed by items 1, 2, and 3; §2.2);
- defining means, operatively connected to said analyzing means, for defining, in-response to an analysis performed by the analyzing means, a set of conditions for a clause in said natural language text database to constitute an answer to said question clause (§2.5, Answer Modules), said conditions comprising a condition stipulating that, for a clause in said natural language text database to constitute an answer to said question clause, at least one of the constituents of said question clause should have a corresponding constituent in said clause having the same syntactic function and an equivalent lexical meaning (§2.4; Sentence-to-Question Comparison Module; ¶13, Values for these comparison matrices were calculated for each sentence by comparing the features of each phrase type); and

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- answer finding means, operatively connected to said storage means and said defining means, for identifying in said natural language text database clauses that satisfy said condition's and for returning answers to said question clause by means of said clauses that satisfy said conditions (Fig. 1, Answer with the Highest Scores; §2.5).

Regarding **claim 16**, Wang describes a question answering system that derives answers from a plain text document (abstract, Fig. 1). Wang's method includes the following steps:

- analyzing a computer readable representation of said question clause with respect to constituents, syntactic functions of the constituents, word tokens of the constituents, and lemmas of the word tokens (Fig. 1, §2, 1st ¶, question is tagged as to part-of-speech, semantic information, and lexically disambiguated; see Fig. 2, note, features shown include LABEL=subject—syntactic function);
- identifying the interrogative pronoun in said computer readable representation of said question clause (§2, "five questions [who, what, where, when, why] are first prepossessed and tagged ..."; Fig. 2, "Who" BASE=who; §'s 2.2, 2.3);
- determining a syntactic function of interest based on the analyzing step and the identified interrogative pronoun (Fig. 2, determining, for example, **Label**, **SemType**; **Base**=Who; §2.5, Answer Modules, techniques to identify the features that were central to identifying the sentence from a story that correctly answers a question);

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- identifying a constituent having the determined syntactic function in the question clause (§2.5, Answer Modules, §3, who-questions, the **SemType** value person plays an important role, ... where questions, location features are important);
- selecting a word token being a lexical head of the identified constituent in the question clause (§2.2.2; parsed with questions with **Base=who** indicated; §2.4 weighting);
- defining a set of conditions comprising a condition stipulating that, for a clause in said natural language text database to constitute an answer to said question clause, the clause comprises a word token having the same lemma as the selected word token of the question clause and being comprised in a constituent having the same syntactic function as the identified constituent of said question clause (Fig. 1, item 5; §2.4, Sentence-to-sentence Comparison Module; §2.2.1, a word's base/stem [lemma] was determined);
- identifying clauses in said natural language text database that satisfy said conditions (§2.4; last sentence, specific information about the feature values for each sentence was passed to the Answer Module; §2.5); and
- returning answers to said question clause by means of the identified clauses that satisfy said conditions (Fig. 1, Answers with Highest Scores; §2.5).

Regarding **claim 17**, Wang teaches everything claimed, as applied above (see claim 16). In addition, Wang teaches "determining a syntactic function of a queried constituent based on the analyzing step and the identified interrogative pronoun (Fig. 2,

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determining, for example, **Label**, **SemType**; **Base=Who**; §2.5, Answer Modules, techniques to identify the features that were central to identifying the sentence from a story that correctly answers a question), wherein said set of conditions comprises a further condition stipulating that, for a clause in said natural language text database to constitute an answer to said question clause, the clause comprises a constituent having the same syntactic function as the queried constituent (§2.5, Answer Modules, §3, who-questions, the **SemType** value of person plays an important role; ... where-questions, location features are important)."

Regarding **Claim 18**, Wang teaches everything claimed, as applied above (see claim 16). In addition, Wang teaches "a verb condition stipulating that, for a clause to constitute an answer to said question clause, the clause comprises a word token being a lexical head of a constituent having the syntactic function main verb, and having the same lemma as the lexical head of the constituent having the syntactic function of main verb of said question clause (§2.2.2, sentence can be parsed into a verb phrase [VP], VP have the features **Base** and **Label**; §2.5, §3, VP **SemType** used for comparison).

Regarding **claim 19**, Wang teaches everything claimed, as applied above (see claim 16). In addition, Wang teaches "a subject condition stipulating that, for a clause to constitute an answer to said question clause, the clause comprises a word token being a lexical head of a constituent having the syntactic function subject, and having the same lemma as the lexical head of the constituent having the syntactic function of

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subject of said question clause" (2.2.2§, sentence can be parsed into a noun phrase[NP], the NP has a **Base** [root word of the head word of the NP], that can have the **Label**, subject; §2.5, Answer Modules, §3, who-questions, the **SemType** value person plays an important role; ... where-questions, location features are important)

Regarding **claim 20**, Wang teaches everything claimed, as applied above (see claim 16). In addition, Wang teaches "an object condition stipulating that, for a clause to constitute an answer to said question clause, the clause comprises a word token being a lexical head of a constituent having the syntactic function object, and having the same lemma as the lexical head of the constituent having the syntactic function of object of said question clause" (2.2.2§, sentence can be parsed into a noun phrase[NP], the NP has a **Base** [root word of the head word of the NP], that can have the **Label**, object).

3. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view Hedin et al. (U.S. Patent 5,386,556), hereinafter referred to as Hedin.

Regarding **claim 5**, Wang teaches everything claimed, as applied above (see claim 1); in addition, Wang teaches that a syntactic and semantic analysis is performed on the query (§2), but Wang does not specifically teach "a manner adverb condition stipulating that a clause constitutes an answer to said question clause if a lexically headed constituent having the syntactic function of manner adverb of said question clause has a corresponding lexically headed constituent in said clause having the

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syntactic function of manner adverb and having an equivalent lexical meaning.”

However, the examiner contends that this concept was well known in the art, as taught by Hedin.

Hedin discloses a natural language analyzing apparatus and method that parses a query and includes a representation for a verbal construct (col. 8, lines 43-48), which would necessarily include manner adverbs.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Wang by specifically providing a parse of the query that includes manner adverbs, as taught by Hedin, because when asking a how-question, manner is significant.

Regarding **claim 6**, Wang teaches everything claimed, as applied above (see claim 1); in addition, Wang teaches that a syntactic and semantic analysis is performed on the query (§2) and that for where-questions, location features are important, **SemType** = location), but Wang does not specifically teach “a place adverb condition stipulating that a clause constitutes an answer to said question clause if a lexically headed constituent having the syntactic function of place adverb of said question clause has a corresponding lexically headed constituent in said clause having the syntactic function of place adverb and having an equivalent lexical meaning.” However, the examiner contends that this concept was well known in the art, as taught by Hedin.

Hedin discloses a natural language analyzing apparatus and method that parses a query and includes a representation for a verbal construct (col. 8, lines 43-48), which would necessarily include place adverbs.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Wang by specifically providing a parse of the query that includes place adverbs, as taught by Hedin, because when asking a where-question, location is significant.

Regarding **claim 7**, Wang teaches everything claimed, as applied above (see claim 1); in addition, Wang teaches that a syntactic and semantic analysis is performed on the query (§2), but Wang does not specifically teach “a time adverb condition stipulating that a clause constitutes an answer to said question clause if a lexically headed constituent having the syntactic function of time adverb of said question clause has a corresponding lexically headed constituent in said clause having the syntactic function of time adverb and having an equivalent lexical meaning.” However, the examiner contends that this concept was well known in the art, as taught by Hedin.

Hedin discloses a natural language analyzing apparatus and method that parses a query and includes a representation for a verbal construct (col. 8, lines 43-48), which would necessarily include time adverbs.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Wang by specifically providing a parse of the

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query that includes time adverbs, as taught by Hedin, because when asking a when-question, the time of an event is significant.

Regarding **claim 8**, Wang teaches everything claimed, as applied above (see claim 1); in addition, Wang teaches that a syntactic and semantic analysis is performed on the query (§2), but Wang does not specifically teach “a causal adverb condition stipulating that a clause constitutes an answer to said question clause if a lexically headed constituent having the syntactic function of causal adverb of said question clause has a corresponding lexically headed constituent in said clause having the syntactic function of causal adverb and having an equivalent lexical meaning.”

However, the examiner contends that this concept was well known in the art, as taught by Hedin.

Hedin discloses a natural language analyzing apparatus and method that parses a query and includes a representation for a verbal construct (col. 8, lines 43-48), which would how include causal adverbs.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Wang by specifically providing a parse of the query that includes causal adverbs, as taught by Hedin, because when asking a how-question, causal adverbs are significant.

4. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of well known prior art (MPEP 2144.03).

Regarding **claims 14 and 15**, Wang teaches everything claimed, as applied above (see claim 1), but Wang does not specifically teach “(claim 14) [a] computer readable medium having computer-executable instructions for a general-purpose computer to perform the steps recited in the claim 1; and (claim 15) [a] computer program comprising computer-executable instructions for performing the steps recited in the claim 1.” However, the examiner takes official notice of the fact that the use of a computer program stored on a computer readable medium for the purpose of executing question-answering algorithms was well known in the art.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Wang by implementing the above-mentioned method and system on a computer, because this practice is necessary for the execution of the algorithms.

Response to Arguments

5. Applicant's arguments with respect to claims 1-13 have been considered but are moot in view of the new ground(s) of rejection.

Citation of Pertinent Art

6. The following prior art made of record but not relied upon is considered pertinent to the applicant's disclosure:

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- Hirschman, et al. ("Deep Read: A Reading Comprehension System" Proceedings of the 37th annual meeting of the Association for Computational Linguistics, 1999) describe a question answering system that accepts arbitrary text input.
- D. M. Magerman ("Statistical decision-tree models for parsing" Proceedings of the 33rd Meeting of the Association for Computational Linguistics, 1995) teaches the concept of a lexical head.
- Riloff, et al., ("A Rule-based Question Answering System for Reading Comprehension Tests," ANLP/NAACL-2000) teach a rule-based technique that uses lexical and semantic heuristics to answer questions.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to V. Paul Harper whose telephone number is 703 305-4197. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on 703 305-9645. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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02/04/2005

V. Paul Harper
Examiner
Art Unit 2654

A handwritten signature in black ink, reading "V. Paul Harper". The signature is written in a cursive, flowing style with a large initial "V".